DESIGNING VIDEO LECTURES FOR MOOC

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Abstract

Educational videos differ from other teaching and learning technologies as they allow the benefit of using visual perception. Video lectures are not new to education, however with the use of innovative video technologies they can improve academic outcomes and extend the reach of education. They may offer extraordinary new experiences for higher education institutions (HEI). Through them lecturers can provide information and contents to students, and if used creatively, video lectures can become a powerful technological tool in education, inside and outside classrooms. Inside a classroom it can motivate students and improve topics' debate and outside it is a good support for students' self-learning. In some cases they can be used to work some subjects standing behind, but needed to support actual courses contents, that students do not remember (or were not even taught), opening an "in front to the past door" that backs students self-study. The student-educator dynamic is changing. Students are expecting exceptional instruction and educators are expecting students to be more and more well informed about subjects from online viewing.This article explores some of the potential benefits and challenges associated with the use of video lectures in the teaching and learning process at higher education. We will also discuss some thoughts and examples for the use of teaching materials to enhance student's learning and try to understand how video can act as powerful and innovative to enlighten teaching and learning (note that unfortunately, sometimes, the opposite is happening).

Keywords: Video-lectures, Open Resources, Higher Education, Online Learning, MOOC, Technologies in Education.

1 INTRODUCTION

The outstanding technological developments in the past 20 years are undoubtedly changing the kind of stimulus to which we react and even the way we deal with them, creating, in particular at the educational level, wholly new teaching and learning paradigms. Teachers from Elementary to High School feel constantly the need to quickly "move forward", recognising these changes and, consequently, developing differentiated didactic tools. Accordingly to Köse [1], the information and communication technologies (ICT) are crucial when trying to overcome these new learning paradigms in higher education. These technologies in general and the virtual learning environments (VLE) in particular, play an important role in the teaching-learning process and in educational practices [2], seeming to be a well-defined bridge between human and "tech" resources.

In this sense, the developments in distance learning platforms, promoted by the huge enlargements of internet connections range, are unstoppable and the number of participants enrolled in worldwide distance courses, like Video-based Learning Systems, as MOOC, sponsored by renowned HEI, is still increasing [3] [4]; however, in Portugal, the number of HEI enrolled in the development of these platforms is still very residual. But this growth in the number of registrations, the first contact with an open learning platform, or course, must go along with increasing participant's enrolment and, among other features and factors, video-lectures seem to play a fundamental role at this stage.

Knowing that videos and on-line media contents are not new, it is important to recognize that they are a complete open and endless field for HEI, as settled by recent research (see [5], for instance), where the innovative video technologies are crucial to extend the reach of education and even improve academic outcomes. However, when used in MOOC courses, videos, and particularly video-lectures, will make the difference between a "really engaging" course and a not so "Massive" one, as they may largely contribute to participants' "drop out" [6]. When we accepted the challenge from our institution – Polytechnic Institute of Porto(1) (IPP), in the end of 2013, to develop some MOOC courses, one of our

(1)Instituto Politécnico do Porto (IPP) began its activity in 1985 as a result of the 1979 re-definition of the national education strategy which re-instated polytechnic universities. IPP is the largest public Polytechnic of Portugal and plays a significant role in the economic development of the Northern part of Portugal. With faculties located in Porto, Matosinhos, Póvoa de Varzim, Vila

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main concerns was, and still is, "how to create a 'really good' video-lecture", and it remains a partially unanswered question. It should be mentioned that our institution is one of the HEI that subscribed the Porto Declaration on European MOOCs[(2)], a document that "…calls upon all to embrace the possibilities the open and online education movement offers the Knowledge Society and stresses the need for stronger collaboration in Europe, based in the principles of transparent cooperation, mutual benefit and collective incremental advantage" ([7], pp.32), trying to oppose the dominant position of the United States in relation to the "MOOC movement".

2 VIDEO TYPES AND DESIGNING POSSIBILITIES

Despite the previous experience in video-lectures production held by some of the teachers enrolled in this MOOC project, granted by the development of MatActiva (a Project settled only in ISCAP and for ISCAP students only: http://paol.iscap.ipp.pt/matactiva/ [8], [9], [10], among others), there were many doubts, recording and re-recording, testing videos, etc. Note that, when these teachers began producing them (2008), there was little information about video-lecture production and the debate about this topic was practically inexistent. Even now there are several but specific problems on video developing and editing, we found quite hard to overcome and there is little information or research about these matters, particularly those related with pedagogical, methodological and technical matters. The central problem for us stays behind the following question: How does anyone turn a teacher-centred material (exposing/reading/talking/...) into a "movie" that stimulates student/ participant's reactions to it and to the questions/contents developed in each one?

Exploring and analyzing several articles on the subject (beyond specified references), seeing and listening to many videos developed by others, registering all kind of problems we felt, assuming the role of "students/participants", i.e. reviewing the work of others and trying to avoid their mistakes, in our point of view, was virtually almost the only, but hard way we had to tackle our path and "keep on" doing something and not giving up.

It is essential, in pedagogical terms, when thinking about video-lecture production to understand the leaner interactions with them (see [11]), to have the perception of what can be done to improve the learner enrolment, to look for and understand the "ingredients" available, as video annotations (see for example [4], among others), and all of these questions also depend upon what "type" of video-lectures in question. As Guo mentioned ([12], p.41), "Video production style often affects student engagement" and he goes forward recognizing several video-lecturers typical styles, like PowerPoint slide presentations (that can be more or less dynamical), classroom lecture, talking instructor at a desk and digital tablet or blackboard drawing format (see Table 1. [12], p.42, for a synthesis of the main findings and video production recommendations). Thus, before embracing video production the first decision to be made is which type of video lecture to use, since there are some different types of video lectures, enhancing distinct skills and matching different video objectives and audiences, namely: Talking Head Video (usually a webcam recording of an instructor, during which he talks on the subject matter); Lecture Capture (live lesson or lecture record); Voice Over Presentation (usually a PowerPoint, Prezi or other presentation software, complemented with a voice over that exposes, talks about, describes and clarifies the issues presented in and/or by the slides) and Interactive Video Lecture (this type is a complete mixture of the previous and may also include digital manipulation of the moving images, besides the normal video, audio, PowerPoint shots and other tools provided by an interactive video player, among other sorts of potential structures, that overcomes the features we are used to since it enables digital composition and manipulation of all sorts).

We elected the Voice Over Presentation "type" to record our video-lectures, using the Camtasia Studio Software, as it allows the connection between visual information, musical background (when and if necessary) and audio narration taking advantage of verbal skills to explain the subject in the clearest

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do Conde, Vila Nova de Gaia and Felgueiras, IPP forms an academic community of over 15 000 students with seven schools in the fields of Engineering, Accounting and Administration, Management, Tourism and Hospitality, Industrial Studies, Technology, Education, Music and Performing Arts and Health Sciences. Its educational portfolio is very appreciated by the labour market due to the specialised competences and skills it provides to its students and has, indeed, a high graduate employment rate. The seven faculties are: ESE School of Education – Porto: http://www.ese.ipp.pt; ESEIG School of Management and Industrial Studies - Vila do Conde / Póvoa de Varzim: http://www.eseig.ipp.pt; ESMAE School of Music and Performing Arts – Porto: http://www.esmae-ipp.pt; ESTGF School of Management and Technology of Felgueiras – Felgueiras: http://www.estgf.ipp.pt; ESTSP School of Allied Health Sciences – Vila Nova de Gaia: http://www.estsp.ipp.pt; ISCAP Institute of Accounting and Administration – Porto: http://www.iscap.ipp.pt; ISEP Institute of Engineering – Porto: http://www.isep.ipp.pt.

[(2)] Which can be assessed at: http://home.eadtu.eu/images/News/Porto_Declaration_on_European_MOOCs_Final.pdf

way, trying to make learning more effective. In each video-lecture, when introducing the visual information of the subjects, we paid cautiously attention to small, but very important, details like working with enhancing, non-distractible, animations. We have asked a Design student from ESEIG to create an animate "mascot" with several expressions – like, yes, no, writing, surprised, questioning, among others – in order to anticipate student´s reactions along the video sessions and in this way we "gave birth" to "R2" (square root of 2).

Although we developed very small video-lectures (8 minutes maximum) we introduced, in several ones, a small group of questions, to be answered before continuing the video visualization in order to promote student engagement and, simultaneously, help them to overcome the tendency to be overconfident in their learning judgment (see some research results in [13]).

Despite the "advantage" of more than 20 years teaching experience, it took us quite a long time to create our videos and, nevertheless, they are quite far from being "perfect". We know that they can be improved in several ways but specifically we would like to focus on one special feature - our voice - this was never examined or evaluated in terms of "sound appeal" as, for as weird as it may seem, the voice tone is vital and even critical to participant's behavior/enrolment, although there is not sufficient research on the influence of this, and other characteristics ([14] [15] [16]).

3 IMPROVE MOOC STRUCTURE AND SCOPE – ANALYTICS AND OTHER CHALENGES

The already mentioned background experience, particularly in the analytics field granted by Moodle platforms and MatActiva Project ([8], [9], [10], [17], [18]), as well as many other insights ([19], [20]), became a "surplus" to help us structure this first MOOC, for example in the sense that the most watched video sessions were directly related with the assignments proposed immediately after. Thus, in addition to the challenges posed in the middle of some video-lectures, each and every single video is connected to an unique group of 5 questions (in a quiz format) that is randomly selected from a data base created only for this purpose (each question with individual feedback, containing a suggestion of solution step by step) as well as other available tools like a dynamic streamlined discussion forum and participant's monitoring.

In our institution we don't identify a widespread use of video-lecturing resources. Although some studies reveal a smaller improvement in Mathematics than in other subjects (see [5] p.5) video-lectures available in MatActiva Project play an important role in the work of prerequisites items students have missed in their previous "math educational life". The video materials available have been very successful and with a wide and strong utilization from our students. However a question has come through our minds: students really feel it helps and know that, at this point in higher education system, professors cannot go back to that "unremembered" matters. So they try hard to be autonomous and gladly work the "missing parts", but will we have the same responsible reaction to video-lectures when goals are not so direct and for "yesterday"? That is what we are looking for to analyse when we have "enough" data to from MOOC Learning Analytics Project, our next challenge.

Annotations are worthwhile practice of writing down information using pen and paper and can be connected to other media types like text and images, in a process that put together reading and critical thinking frequently named active reading [21]. However, annotations can also be applied to digital platforms and documents. A similar process to the active reading can associate annotations to video content, called video annotations. This is a recent subject that promotes collaborative work and the students' participation, creating discussions around common points of interest (revealed by annotation). There are already some remarking developments in multimedia annotations, promoted by University Projects[(3)], among others, with some free plugins allowing any participant to place tags on a video-lecture. These tags seem to be a way of promoting students' enrolment since they can interact with a, until now, static content: they can make a direct question or remark, "straight on" the issue. From the video-lectures developers' point of view, annotations can be a very important instrument to improve the following editions. However, allowing annotations of any kind and at any place will certainly be time consuming for the professor supervising and accompanying the course development since he also needs to be interactive (online), at least for a feedback, comment or withdraw the

[(3)] See, for example, Project Pad2 from Northwestern University: http://dewey.at.northwestern.edu/ppad2/index.htm or OVA project (Open Video Annotation Project) led by the Center for Hellenic Studies in Harvard University and supported by a grant from the Becas Talentia program from the Junta de Andalucia, Spain: http://www.openvideoannotation.org

incoming (of any kind) annotations. It seems that all higher education institutions actors could only benefit with the development of good video portfolios [22] [23], for instance:

- Extending classes anytime, providing students the possibility of learning in their own "timing", even anticipate some topics, giving the professor more class available time to explore particular and practical difficulties or allowing multiple reviewing of specific items. Note that some studies reveal that learning is more effective when provided in real time accordingly to each student needs and, in this sense, video-lecture support may have direct impact [24].
- Extending classes anywhere, allowing study and review anyplace, even worldwide, is a way of promoting the "just-in-time" work frame.
- Supporting a natural multisensory learning environment, that takes advantage of well-known tools for students, remembering that they were born in the video and digital era, were image is crucial in their learning process, that began years before.
- The recent development in annotations software, opens new insights in video-lectures utilization, promoting a much more dynamical and interactive use that may promote students enrolment, particularly in MOOC courses and trying to illustrate how video annotations can be used in eLearning contexts [25].
- Among many others "pros" in video-lectures development/improvement and implementation, we cannot forget the financial ones [5] but, at least for a good starting point, institutions must consider the existence of a minimum "compulsory" investment.
- Using a video annotation system a professor can also ask students to carefully watch a lecture video and annotate the timeline, underlining time segments within the video where lecture topics might be confusing or need further explanation. The instructor can then review the annotated segments of the video and reply to student questions with media plentiful notes, links to further media resources and straight citations to resources in the libraries. Moreover, the instructor can review the annotations before the lecture and rapidly engage students in a discussion by addressing these topics throughout the class.

4 FINAL COMMENTS

As lecturers in HEI, but "teachers" generally speaking, our fundamental concern, beside the correction of scientific processes involved, must turn into pedagogical procedures. As stated by Kay in [16], there seems to be some "emptiness", showed in his literature review, about many pedagogical issues, namely:

- The optimum length for engaging video-lectures and it's (in)dependence upon subjects;
- The associated effectiveness of synopses against full video-lectures;
- The potential feedback given through videos, among many others.

Questioning the implications of some video interfaces design characteristics, we can see in [11] several research results, with some insights about dropout and peak views of video in various video-based learning systems and it is directly stated that these seem to depend "on the visual, pedagogical, and stylistic properties of the video" and some concerns/advises, to take in account when designing video interfaces, are identified, like, for instance:

- Create short videos;
- Summarize (for selective watchers);
- Avoid unexpected and sudden transitions in videos;
- Offer interactive links and screenshots for "highlights";
- Provide one-click access to fundamental parts in video-lectures.

Among other recent research results that may contribute to enhance an effective learning procedure directly connected with video-lectures, there is natural and expectable one, whose respective validation may be seen and analyzed in [25] that is the revealed significance of collaborative video watching since synchronicity while watching in group seems to "provide highly satisfying learning experience as leaners feel connected and interactions among them are enable" ([26],pp.231).

Video-lectures play a remarkable role supporting a natural multisensory learning environment that takes advantage of well-known tools for students, since they were born in the video and digital era, where image is crucial in their learning process that began years before. As Boster stated in [14], "There are several reasons to expect that the use of video streaming to supplement teacher lesson plans will enhance learning" and, speaking of Mathematics in particular "there is evidence to indicate that a technology-based instructional tool, such as video streaming, might be especially well suited to improving students' mathematical proficiency" in the sense that visualisation helps to deconstruct some abstract concepts.

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